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Research Article

Knowledge Regarding Vitamin D Among Private University Students in Malaysia

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Abstract

Background: Vitamin D is known as the sunlight vitamin which mainly helps in bone metabolism and calcium homeostasis. It is estimated that one billion people have vitamin D deficiency and it is considered as a public health problem. The purpose of this study is to explore the knowledge among students regarding vitamin D and its associated factors.

Methods: A cross-sectional study was conducted among 360 private university students using self- administered questionnaires regarding vitamin D Knowledge on aspects of vitamin D sources, health benefits, factors of vitamin D deficiency and recommended intakes and some others.

Results: Females were more predominant in this study (69.4 %). Most students are aware and have good knowledge regarding vitamin D with male having a higher knowledge compared to female. Besides that, 69% of them agreed that vitamin D main source is the sun. only 11.1 % know the correct answer regarding the recommended daily dosage of vit. D which is 600 IU per day.

Conclusion: Results acquired have shown some understanding towards the insight of vitamin D among university students. Implementing campaigns and future health programs to the public helps building more awareness and knowledge about vitamin D importance.

Keywords: Vitamin D; Vitamin D-related knowledge; Malaysia; University students

Introduction

Vitamin D is known as the sunshine vitamin. It is one of the oldest hormone that have been made in the earliest life forms for over 750 million years. Phytoplankton, zooplankton and most plants and animals that are exposed to sunlight have capacity for producing vitamin D [1]. It is an essential steroid involved in bone metabolism, cell growth, differentiation, and regulation of the minerals in the body [2]. Vitamin D is unique, in terms of its metabolism and physiological features and the human reliance on both endogenous production (exposure to UV light) and exogenous sources (diet mainly fortified foods) to meet biological requirements [3].

There are some factors in human that affects the amount of vitamin D production in sunshine months. It is important that it is not just where you live that influences how much vitamin D you can make from the sun while other factors also come into play (Take Vitamin). Astronomical factors that govern the Solar Zenith Angle (SZA), and the local state of the atmosphere, available solar UV radiation, skin pigmentation and age, determining competing absorbers of UV radiation, individual behavior to local environment and exposure of unprotected skin available UV radiation [4].

Micka [5] stated that there is an increasing interest in the role and the importance of vitamin D in global public health. There is a growing awareness that vitamin D sufficiency is required for optimal health. The role of vitamin D in calcium absorption and metabolism for bone health is well known [6]. Also, vitamin D plays an undeniably important role in maintenance of bone status, preventing the development of rickets and osteomalacia [7]. Research illustrated the importance of vitamin D in numerous chronic diseases including cancers, heart diseases, Multiple Sclerosis, and Diabetes type 1 and 2 [8]. There needs to be a better appreciation about the importance of vitamin D for overall health and well being [1].

Moreover, much attention has focused on the positive health benefits of vitamin D beyond its established role in calcium homeostasis. Epidemiology has highlighted the link between vitamin D deficiency and prevalent diseases such as common cancers and autoimmune diseases. Studies in vitro have shown that the active form of vitamin D is a potent anti-proliferative and immunosuppressive agent. However, there is also other non-calcemic effects than the normal calcium and bone homeostasis of vitamin D that are dependent on extra-renal synthesis of active vitamin D via the enzyme 1α-hydroxylase at barrier sites throughout the body [9].

As Moreover, we know that sunlight is the main risk factor for melanoma in the world. Therefore, sun exposure is not a preferred way to uptake VitD worldwide. Very few foods are naturally rich in vitamin D, so the biggest dietary sources of vitamin D are fortified foods and vitamin supplements. Good sources include dairy products and breakfast cereals (both of which are fortified with vitamin D), and fatty fish such as salmon and tuna [10].

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Although vitamin D toxicity is a rare condition but it can occur when highly excessive amounts of vitamin D are taken [11]. According to the Institute of Medicine in United States [12], people (aged 1-70 years) should not consume more than 4000 IU per day, as it could lead to potential adverse effects such as hypercalcemia and hyperphosphatemia.

First and foremost, in conducting this study, one should have to know that university students are those most at risk and at a domain age of developing lifelong health behaviors' that leads to long-term effects of health. Despite that, low vitamin D status has been associated with the development of rickets and osteomalacia, and has been considered to lead to bone loss, fractures and falls [13]. Vit. D Deficiency remains common in children and in adult. In-utero and during childhood, it can cause growth retardation and skeletal deformities and may increase the risk of hip fracture in later life. While in adults, muscle weakness and increase the risk of fracture [10].

In recent years, a high prevalence of Vit. D Deficiency among children and adolescent has been reported in countries with moderate climates. Those with an immigrant background living under these conditions are at high risk especially the country Germany [14]. VDD is widespread in both men and women born in Turkey, Sri Lanka, Iran, Pakistan and Vietnam living in Oslo. The knowledge is higher among women than among men, and it is highest in women born in Pakistan [15]. The male immigrants with a Turkish or Arab-Islamic background had an increased risk of having 25(OH) D concentrations <25nmol/L compared with non-immigrants [14].

Methods

A cross sectional study was conducted among 360 students at private university within four months duration in 2013. Convenient Sampling method was used in this study. A self- administered questionnaires was developed to assess knowledge related to vitamin D among private university students.

The questionnaires were consisted of part A about socio-demographic characteristics of the respondents and part B about vit D knowledge, such as the main sources of vit. D, the daily recommended dosage of vit. D, the average time needed to spend under sun to get the recommended dosage of vit. D and percentage of Malaysia suffering from vit. D insufficiency.

The data was analyzed using IBM Statistical Package of Social Sciences (SPSS) software made for Windows Version 20.0. A consent form was signed by all participants before answering the questionnaires.

Results

Females were more predominant in this study (69.4 %), also the most participant were from the age group 21-25 years old (61.2%) followed by 16-20 years old group. The most common monthly income was more than 4000 ringgit Malaysian (35.5%) as shown in Table 1. Most of the Participant (50.8 %) were from medical school followed by 32.8% from Faculty of Business Management and Professional Studies , 6.7% from faculty of health & life science and (4.7) % from School of Education & Social Sciences .

Participants were asked about the sources of vitamin D and were allowed to select more than one answer. Based on the results calculated, only few (7.2%) of the respondents indicated that they did not know where vitamin D comes from, while 69.2% of respondents correctly identified the sun as vitamin D source. Also, about 58.1% of them have correctly chosen vitamin D supplements as the source of vitamin D. Fatty fish was also correctly identified as a vitamin D source by 12.5% of the respondents, as were selected cereals (7.8%), milk/Dairy products (17.8%), Cod liver oil (15.6%), eggs (11.1%) and also mushrooms (4.4%). Although one of each of the respondents was able to select at least one correct answer however, 75.4% of the participants also have chosen incorrect responses such as fruits (28.3%), water (2.2%) and vegetables (26.9%) as shown in Table 2.

Regarding the knowledge about Vit D daily recommended dose, only 11.1 % know the correct answer which is 600 IU per day, while 60.3% did not know the answer. About the time needed to spend

Table 1: Socio-demographic characteristics of the respondents.

Variables	Frequency	Percentage
	N	%
Gender		
Male	110	30.6
Female	250	69.4
Age		
16-20	88	24.4
21-25	227	63.1
26-30	40	11.1
more than 30	5	1.4
which best describes your main occupation Environment		
mainly indoors	150	41.7
half indoor and half outdoors	176	48.9
mainly outdoors	34	9.4
Monthly Income		
no income	30	8.3
less than RM1000	29	8.1
RM1000-RM2000	57	15.8
RM2000-RM3000	72	20.0
RM3000-RM4000	45	12.5
more than RM4000	127	35.3
Father educational level		
can't write and only read	4	1.1
can't write and read	9	2.5
primary school	13	3.6
secondary school	116	32.2
higher education	218	60.6
Mother educational level		
can't write and only read	4	1.1
can't write and read	11	3.1
primary school	22	6.1
secondary school	142	39.4
higher education	181	50.3

Table 2: Knowledge of vitamin D sources.

Variables	Frequency	Percentage
	N	%
Vitamins D sources		
Fruits	102	28.3
Vegetables	97	26.9
Fatty fish	45	12.5
I don't know	26	7.2
Water	8	2.2
***Sun**	**249**	**69.2**
***Vit. D supplement**	**209**	**58.1**
***Milk/dairy**	**64**	**17.8**
***Cod liver oil**	**56**	**15.6**
***Eggs**	**40**	**11.1**
Nuts	34	9.4
***Selected cereals**	**28**	**7.8**
Air	16	4.4
Chicken	15	4.2
***Mushrooms**	**16**	**4.4**

*This one indicate the correct answer
*Participant can choose more than one option.

under the sun to get Vit. D , 11.9% only recognized the correct answer which is 10-60 minutes per week. Regarding the percentage of Malaysian suffering from vit D insufficiency, only 16.7 % know the correct answer which is 25% as shown in Table 3.

Discussion

This study was conducted to assess the knowledge of students regarding vitamin D. Vitamin D is an important element and is needed in our body for almost all metabolism activities and functioning of essential many human body systems. It is required especially for infants, young children (proper growth), immune compromised patients such as Human Immunodeficiency Virus (HIV) or Tuberculosis (TB) patients or pregnant or even lactating women.

Generally, participants scored a good knowledge of identifying the sources of vitamin D can be obtained. Out of 360 of those who had participated in this study, about 249 students had correctly identified the sun as the main source and 209 of students identified vitamin D supplements for vitamin D production. This percentage is lower than a study done by Kung & Lee [16] which they found that 91% of participants recognized sun as the mail source of Vit. D, but its higher that a study done by Vu et al. [17] where the percentage was only 23%. University students are in the period of growing ages. Therefore, getting to know the correct sources of vitamin D is important for development of many vital functions in human body. Regard this, irregular intake of vitamin D, irrespective of the source, can lead to chronic vitamin D inadequacy. This condition has been reported across all age groups, geographic regions and seasons. Enhancing vitamin D levels by taking supplements is usually necessary to achieve the minimum recommended daily intakes; however, compliance is often problematic. In particular, some groups who may be at high risk of vitamin D inadequacy often do not follow regular daily dosing guidelines.

Regarding the Daily Recommended Intake (DRI) of vitamin D, only 11% of respondents have correctly identified as 600 IU daily while only 11.9% of respondents correctly identified the time needed for a fair-skinned individual and 19.7% of respondents correctly identified the time needed for a non-fair-skinned individual to spend under the sun to produce enough vitamin D. Each person varies of the capacity to get enough vitamin D in their respective body. However, some studies had been done to find out the average recommended intake for all individuals but not each specifically. This finding was similar to study done by Vu et al. [17] as people often thought they required more time in the sun to produce adequate vitamin D.

It must be recognized that Malaysia, which is around the equator, the most physiologically relevant and efficient way of acquiring vitamin D is to synthesize it endogenously in the skin by sunlight (UV) exposure. In most situations, approximately 30 minutes of skin exposure (without sunscreen use) of the arms and face to sunlight can provide all the daily vitamin D needs of the body.

As predicted, most of the respondents had heard of vitamin D from school, newspaper, family and by physicians. While study done by Vu et al. [17] got their knowledge from media (40%). This shows that most students had a good knowledge from the teaching in the school by teachers, lecturers or even some professors. Student who got their knowledge from physicians, schools, and some health professional scored better knowledge, even though only 18.6% of participants have gained knowledge from nurses, 21% from health professionals, and 33.6% from physicians.

Although 98% of the subjects answered yes, when asked about heard of vitamin D, however most of them (62%) do not take vitamin D supplements. This shows that most of them had only heard of vitamin D despite of knowing the exact benefits of the vitamin. In a positive side of this study, vitamin D knowledge and vitamin D supplement use were associated. One of the good news is that, although majority of them does not take vitamin D supplements, however people who has higher knowledge of vitamin D has increased in intake of vitamin D supplement.

Limitations of the Present Study

There is few limitation factors were identified in this study. Firstly, the sample population, although the sample size was large in numbers, the sample was derived from only one university and therefore may not be generalized to the whole Malaysian student populations. Besides that, there was time limitation in which was busy with examination weeks and unable to allocate time to focus on the research study especially in completing the results and discussions. Regard to the knowledge score calculation, the actual vitamin D knowledge value may have been minimized by deducting equally-weighted points for incorrect responses. Despite these limitations, many important information and understanding about vitamin D and of university students has been found.

Conclusion and Future Prospects

As a conclusion, about 69% of students have good knowledge in which had correctly identified sun exposure as the main source

Table 3: Vitamin D Knowledge.

Variables	Frequency	Percentage
	N	%
From where you get information regarding vit. D?		
Nurses	67	18.6
School	208	57.8
Newspaper	143	39.7
Family	146	40.6
Friend	94	26.1
Television	102	28.3
Health professionals	76	21.1
Physician	121	33.6
What is the daily amount of vitamin D currently recommended for adults		
I don't know	217	60.3
200 IU	18	5.0
400 IU	23	6.4
***600 IU**	**40**	**11.1**
800 IU	23	6.4
1000 IU	23	6.4
1500 IU	11	3.1
2000 IU	5	1.3
How much time would the average non-fair skinned person need to spend in the sun to get enough vitamin D		
I don't know	131	36.4
less than 10 minutes	81	22.5
about 1-2 hrs per week	75	20.8
more than 2 hrs per week	30	8.4
***10-60 minutes per week**	**43**	**11.9**
What percentage of the Malaysian population is estimated to be vitamin D insufficient		
5%	71	19.7
0.5%	81	22.5
10%	129	35.8
0%	19	5.3
***25%**	**60**	**16.7**
How much vitamin D do you take daily?		
I don't take a vitamin D supplement	222	61.7
I take but don't know how much i take	58	16.1
I only take a multivitamin	70	19.4
I take vitamin D	10	2.8

*This one indicate the correct answer
* For the source of information, participant can choose more than one source.

of vitamin D. However, vitamin D deficiency cases are still high. Therefore, campaigns and more health concerning programs should be held for people to increase their knowledge and awareness regarding vitamin D and sunlight. Also, the programs must be conducted by people that are trusted and having a high knowledge such as doctors, nurses or even lecturers. Educational campaigns created should be more effective for the public in which should be emphasizing more about personal responsibility, importance of outdoors activities and adequate daily intake to improve overall health.

References

1. Holick MF. Vitamin D: A millenium perspective. See comment in PubMed Commons below J Cell Biochem. 2003; 88: 296-307.
2. Alagöl F, Shihadeh Y, Boztepe H, Tanakol R, Yarman S, Azizlerli H, et al. Sunlight exposure and vitamin D deficiency in Turkish women. See comment in PubMed Commons below J Endocrinol Invest. 2000; 23: 173-177.
3. Raiten DJ, Picciano MF. Vitamin D and health in the 21st century: bone and beyond. Executive summary. See comment in PubMed Commons below Am J Clin Nutr. 2004; 80: 1673S-7S.

4. Webb AR. Who, what, where and when-influences on cutaneous vitamin D synthesis. See comment in PubMed Commons below Prog Biophys Mol Biol. 2006; 92: 17-25.

5. Micka A. Vitamin D Status among Bangladeshi Women of Reproductive Age. Masters Theses, 2009. University of Massachusetts – Amherst.

6. Grant WB, Holick MF. Benefits and requirements of vitamin D for optimal health: a review. See comment in PubMed Commons below Altern Med Rev. 2005; 10: 94-111.

7. Janda M, Kimlin M, Whiteman D, Aitken J, Neale R. Sun protection and low levels of vitamin D: are people concerned? See comment in PubMed Commons below Cancer Causes Control. 2007; 18: 1015-1019.

8. Christie FT, Mason L. Knowledge, attitude and practice regarding vitamin D deficiency among female students in Saudi Arabia: a qualitative exploration. International Journal of Rheumatic Diseases. 2011; 14: e22-e29.

9. Hewison M, Zehnder D, Chakraverty R, Adams JS. Vitamin D and barrier function: a novel role for extra-renal 1 alpha-hydroxylase. See comment in PubMed Commons below Mol Cell Endocrinol. 2004; 215: 31-38.

10. Holick MF. Vitamin D deficiency. See comment in PubMed Commons below N Engl J Med. 2007; 357: 266-281.

11. Vieth R. Vitamin D supplementation, 25-hydroxyvitamin D concentrations, and safety. See comment in PubMed Commons below Am J Clin Nutr. 1999; 69: 842-856.

12. Yates AA, Schlicker SA, Suitor CW. Dietary Reference Intakes: the new basis for recommendations for calcium and related nutrients, B vitamins, and choline. See comment in PubMed Commons below J Am Diet Assoc. 1998; 98: 699-706.

13. Cranney A, Horsley T, O'Donnell S, Weiler H, Puil L, Ooi D, et al. Effectiveness and safety of vitamin D in relation to bone health. See comment in PubMed Commons below Evid Rep Technol Assess (Full Rep). 2007; : 1-235.

14. Hintzpeter B, Scheidt-Nave C, Müller MJ, Schenk L, Mensink GB. Higher prevalence of vitamin D deficiency is associated with immigrant background among children and adolescents in Germany. See comment in PubMed Commons below J Nutr. 2008; 138: 1482-1490.

15. Holvik K, Meyer HE, Haug E, Brunvand L. Prevalence and predictors of vitamin D deficiency in five immigrant groups living in Oslo, Norway: the Oslo Immigrant Health Study. See comment in PubMed Commons below Eur J Clin Nutr. 2005; 59: 57-63.

16. Kung AW, Lee KK. Knowledge of vitamin D and perceptions and attitudes toward sunlight among Chinese middle-aged and elderly women: a population survey in Hong Kong. See comment in PubMed Commons below BMC Public Health. 2006; 6: 226.

17. Vu LH, van der Pols JC, Whiteman DC, Kimlin MG, Neale RE. Knowledge and attitudes about vitamin D and impact on sun protection practices among urban office w orkers in Brisbane, Australia. Cancer Epidemiology, Biomarkers & Prevention. 2010.

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